CONTENTS OF VOLUME 34

Number 1

Foreword 1 T. AP REES

Review Article Number 80
Relevance of seed polysaccharides and flavonoids for the classification of the Leguminosae: a chemotaxonomic approach 3 R. HEGNAUER and R. J. GRAYER-BARKMEIJER

Review Article Number 81
Steryl fatty acyl esters in plants 17 L. DYAS and L. J. GOAD

Review Article Number 82
Chemistry and biochemistry of opines, chemical mediators of parasitism 31 Y. DESSAUX, A. PETIT and J. TEMPE

Growth and Metabolism
Preconditioning and germination of *Orobanche* seeds: respiration and protein synthesis 39 N. BAR NUN and A. M. MAYER

Induction of laccase formation in *Botrytis* and its inhibition by cucurbitacin: is gallic acid the true inducer? 47 A. VITERBO, B. YAGEN and A. M. MAYER

Asparaginase from the testa of developing lupin and pea seeds 51 L. SODEK and P. J. LEA

Modulation of CTP:phosphocholine cytidylyltransferase activity in choline-sensitive and choline-resistant tobacco cells 57 M. GAWER, D. CHERVIN, N. GUERN and P. MAZLIAK

Unusual long-chain monoenoic fatty acids in conidia of *Erysiphe graminis* 65 I. J. SENIOR, D. W. HOLLOMON and P. J. HOLLOWAY

Use of [2-^{3}H]glycerol precursor in radiolabelling studies of acyl lipids in developing seeds of *Brassica napus* 69 H. J. PERRY and J. L. HARWOOD

Effects of anoxia on growth and carbohydrate metabolism in suspension cultures of soybean and rice 75 B. MOHANTY, P. M. WILSON and T. AP REES

Changes during gametophyte development in *Matteuccia struthiopteris* from the cinnamate to the chalcone synthase pathway 83 Y. ARAKI and G. COOPER-DRIVER

Demonstration that flavone aglycones accumulate in the peltate glands of *Mentha* × *piperita* leaves 85 B. VOIRIN, C. BAYET and M. COLSON

Ecological Biochemistry
Molluscicidal milliamines from *Euphorbia milii* var. *hislopii* 89 C. L. ZANI, A. MARSTON, M. HAMBURGER and K. HOSTETTMANN

Diterpenes from *Chrysoma pauciflosculosa:* effects on Florida sandhill species 97 M. A. MENELAOU, J. D. WEIDENHAMER, G. B. WILLIAMSON, F. R. FRONCZEK, H. D. FISCHER, L. QUIJANO and N. H. FISCHER

Secondary metabolite chemistry of the Australian brown alga *Encyothalia cliftonii*: evidence for herbivore chemical defence 107 V. ROUSSIS, R. L. KING and W. FENICAL

The proanthocyanidin polymers in some species of *Onobrychis* 113 M. R. KOUPAI-ABYAZANI, A. D. MUIR, B. A. BOHM, G. H. N. TOWERS and M. Y. GRUBER

Anthocyanin intramolecular copigment effect 119 O. DANGLES, N. SAITO and R. BROUILLARD

Biosynthesis
Purification and characterization of salutaridine:NADPH 7-oxidoreductase from *Papaver somniferum* 125 R. GERARDY and M. H. ZENK

The biotransformation of two ent-15β,16β-epoxy-kaurane derivatives by *Gibberella fujikuroi*	133	B. M. Fraga, M. G. Hernández, F. García-Tellado, P. González and A. Perales
Inhibition of phytosterol biosynthesis in elicitor-treated cultures of *Ammi majus*	139	D. C. Fulton, P. A. Kroon, U. Matern, D. R. Threlfall and I. M. Whitehead
Enzymatic prenylation of isoflavones in white lupin	147	P. Laflamme, H. Khouri, P. Gulick and R. Ibrahim
Formation of *N'*-ethyl-*S*-nornicotine by transformed root cultures of *Nicotiana rustica*	153	H. D. Boswell, A. B. Watson, N. J. Walton and D. J. Robins
Cell Culture and Biotechnology		
Coumaroylaspartate from cell suspension cultures of *Arabidopsis thaliana*	157	H.-P. Mock, V. Wray, W. Beck, J. W. Metzger and D. Strack
The accumulation of phenylpropanoid glycosides in tissue cultures of *Tecoma sambucifolium*	161	M. Pletsch, S. Piacente, C. Pizza and B. V. Charlwood
Additional flavonoids from elicitor-treated cell cultures of *Cephalocereus senilis*	167	Qin Liu, R. A. Dixon and T. J. Mabry
Accumulation of tetrapeptide precursors of macrocyclic alkaloids by callus of *Ceanothus americanus*	171	M. A. Baig, D. V. Banthorpe, A. A. Coleman, M. D. Tampion, J. Tampion and J. J. White
Chemotaxonomy		
Sulphur-containing amides from *Glycosmis* species with different antifungal activity	175	H. Greger, G. Zechner, O. Hofer, F. Hadacek and G. Wurz
Terpenoids from six Lophoziaceae liverworts	181	M. Tori, T. Nagai, Y. Asakawa, S. Huneck and K. Ogawa
Phytochemical evidence for the botanical origin of tropical propolis from Venezuela	191	F. A. Tomás-Barberán, C. García-Viguera, P. Vit-Olivier, F. Ferreres and F. Tomás-Lorente
Correlations between leaf flavonoids, taxonomy and plant geography in the genus *Disporum*	197	C. A. Williams, J. Richardson, J. Greenham and J. Eagles
8-Hydroxylated flavone *O*-glycosides and other flavonoids in chemotypes of *Gratiola officinalis*	205	R. J. Grayer-Barkmeijer and F. A. Tomás-Barberán
Acylated flavone and glycerol glucosides from two *Frullania* species	211	L. Kraut, R. Mues and M. Sim-Sim
Ten isoprenylated and *C*-methylated flavonoids from the leaves of three *Vellozia* species	219	J. B. Harborne, J. Greenham, C. A. Williams, J. Eagles and K. R. Markham
Distribution of flavonoid aglycones and glycosides in *Sideritis* species from the Canary Islands and Madeira	227	M. I. Gil, F. Ferreres, A. Marrero, F. Tomás-Lorente and F. A. Tomás-Barberán
Plant Chemistry		
Configurations and conformations of abscisic acid	233	R. D. Willows and B. V. Milborrow
Iridoids and verbascosides in *Retzia*	239	S. Damtoft, H. Franzyk, S. R. Jensen and B. J. Nielsen
Guaiane sesquiterpenes from *Teucrium leucocladum*	245	M. Bruno, M. C. de la Torre, B. Rodríguez and A. A. Omar
Sesquiterpene lactones from *Inula britannica*	249	Bing-Nan Zhou, Nai-Sheng Bai, Long-Ze Lin and G. A. Cordell
Piptocarphols and other constituents of *Chrysolaena verbascifolia* and *Lessingianthus rubricaulis*	253	A. Bardón, S. Montanaro, C. A. N. Catalán, J. G. Diaz and W. Herz

Flavonoids and heliangolides from *Lychnophora diamantinana* 261 F. Batista da Costa, D. A. Dias, J. L. Callegari Lopes and W. Vichnewski

Clerodane diterpenoids from *Croton lechleri* 265 Y. Cai, Z. P. Chen and J. D. Phillipson

Brevifoliol: a structure revision 269 A. Chu, J. Zajicek, G. H. N. Towers, C. M. Soucy-Breau, N. G. Lewis and R. Croteau

D:A-Friedo-oleanane triterpenes from the stem bark of *Phyllobotryon spathulatum* 273 S. Gibbons, A. I. Gray, D. C. R. Hockless, C. Lavaud, J.-M. Nuzillard, G. Massiot, P. G. Waterman and A. H. White

Moretenolactone, a β-lactone hopanoid from *Ficus insipida* 279 D. Lopes, C. T. Villela, M. A. C. Kaplan and J. P. P. Carauta

Two acetogenins from *Annona muricata* seeds 281 F. Roblot, T. Laugel, M. Lebœuf, A. Cavé and O. Laprévote

Diphysin, a 3-3″-dimeric 4-phenyldihydrocoumarin from *Dyphysa robinioides* 287 F. R. Stermitz, E. W. Mead, T. A. Foderaro and O. Castro C.

A trimeric propelargonidin from stem bark of *Heisteria pallida* 291 V. Dirsch, A. Neszmélyi and H. Wagner

Biflavonoids from the moss *Homalothecium lutescens* 295 T. Seeger, H. Geiger, H. D. Zinsmeister and W. Rozdzinski

Methylene bisflavonoids from frond exudate of *Pentagramma triangularis* spp. *triangularis* 297 J. N. Roitman, R. Y. Wong and E. Wollenweber

Diverse oxygenated isoflavonoids from *Piscidia erythrina* 303 S. Tahara, M. Moriyama, J. L. Ingham and J. Mizutani

Book Review
Secondary Metabolite Biosynthesis and Metabolism: edited by R. J. Petroski and S. P. McCormick 317 J. Mann

Number 2

Announcement ix

Review Article Number 83
The anthranilamide phytoalexins of the Caryophyllaceae and related compounds 319 G. J. Niemann

Growth and Metabolism
Phosphorylation of RUBISCO in *Cicer arietinum*: non-phosphoprotein nature of RUBISCO in *Nicotiana tabacum* 329 K. K. Aggarwal, D. Saluja and R. C. Sachar

Immunochemical analysis of chloroplast polypeptides from maritime pine 337 A. García-Gutiérrez, F. R. Cantón, F. Gallardo and F. M. Cánovas

Purification and partial characterization of a lectin from *Datura innoxia* seeds 343 S.-M. Petrescu, A.-J. Petrescu and H. E. F. Rüdiger

Inhibitory effects of cysteine and aromatic acids on tyrosinase activity 349 S. Kermasha, M. Goetghebeur, A. Monfette, M. Metche and B. Rovel

β-Galactosidase from *Coffea arabica* and its role in fruit ripening 355 K. D. Golden, M. A. John and E. A. Kean

Activation of corn glutathione *S*-transferase enzymes by coumaric acid and 7-hydroxycoumarin 361 J. V. Dean and J. H. Machota

Binding of IAA and ABA to phospholipid bilayers	367	W. Stillwell and S. R. Wassall
Changes in fatty acid and lipid composition of wheat when treated with a chemical hybridizing agent	375	N. Goasdoue, C. Goasdoue, F. Dardoize and R. Couffignal
Lipid components of the Mediterranean seagrass *Posidonia oceanica*	381	A.-C. Viso, D. Pesando, P. Bernard and J.-C. Marty
Distribution of α-tocopherol in early foliage samples in several forage crops	389	W. A. Tramontano, D. Ganci, M. Pennino and E. S. Dierenfeld
28-Homoteasterone, a naturally occurring brassinosteroid from seeds of *Raphanus sativus*	391	J. Schmidt, T. Yokota, B. Spengler and G. Adam
Ecological Biochemistry		
Chemical composition and biological origin of 'dirty sea' mucilages	393	F. De Angelis, M. V. Barbarulo, M. Bruno, L. Volterra and R. Nicoletti
Persea indica as a natural source of the insecticide ryanodol	397	A. González-Coloma, R. Cabrera, A. R. Socorro Monzón and B. M. Fraga
The antifouling activity of natural and synthetic phenolic acid sulphate esters	401	J. S. Todd, R. C. Zimmerman, P. Crews and R. S. Alberte
Periandrin V, a further sweet triterpene glycoside from *Periandra dulcis*	405	R. Suttisri, M.-S. Chung, A. D. Kinghorn, O. Sticher and Y. Hashimoto
Steroid glucosides from *Vernonia amygdalina*, a possible chimpanzee medicinal plant	409	M. Jisaka, H. Ohigashi, K. Takegawa, M. Hirota, R. Irie, M. A. Huffman and K. Koshimizu
Insecticidal constituents from four species of the Zingiberaceae	415	C. Pandji, C. Grimm, V. Wray, L. Witte and P. Proksch
Malonylated flavonoids and blue flower colour in lupin	421	K. Takeda, J. B. Harborne and P. G. Waterman
Biosynthesis		
Phenyllactic acid in *Duboisia leichhardtii* root cultures by feeding of phenyl[1-^{14}C]alanine	425	Y. Kitamura, S. Nishimi, H. Miura and T. Kinoshita
Chemotaxonomy		
Subunit polypeptide composition of RUBISCO indicates *Diplotaxis viminea* as maternal parent species of amphiploid *Diplotaxis muralis*	429	K. Mummenhoff, G. Eschmann-Grupe and K. Zunk
Occurrence of the cyanogenic glucoside prunasin and its corresponding mandelic acid amide glucoside in *Olinia* species (Oliniaceae)	433	A. Nahrstedt and J. Rockenbach
Ipangulines, the first pyrrolizidine alkaloids from the Convolvulaceae	437	K. Jenett-Siems, M. Kaloga and E. Eich
Plant Chemistry		
Mono and sesquiterpenoids from *Satureja gilliesii*	441	C. Labbe, M. Castillo and J. D. Connolly
Sesquiterpene lactones of *Centaurea salonitana*	445	W. M. Daniewski, G. Nowak, E. Pankowska, T. Georgiadis, E. Routsi, U. Rychlewska and B. Szczepańska
Diterpenoids from *Calceolaria petioalaris*	449	P. Silva, M. C. Chamy, M. Piovano and J. A. Garbarino
Scutalpin A, a *neo*-clerodane diterpene from *Scutellaria alpina*	453	P. I. Bozov, P. Y. Malakov, G. Y. Papanov, M. C. de la Torre, B. Rodríguez and A. Perales

Clerodanes from *Polyalthia viridis*	457	A. Kijoa, M. M. M. Pinto, P. M. M. Pinho and W. Herz
Diterpenoids from *Rabdosia forrestii*	461	Yunlong Xu, I. Kubo, Chungshih Tang, Fenglei Zhang and Handong Sun
Diterpenes from *Psiadia arabica*	467	M. M. El-Domiaty, F. S. El-Feraly, J. S. Mossa and A. T. McPhail
Intramolecular acyl migrations in taxanes from *Taxus brevifolia*	473	A. Chu, L. B. Davin, J. Zajicek, N. G. Lewis and R. Croteau
NMR structure determination and intramolecular transesterification of four diacetyl taxinines which co-elute with taxol obtained from *Taxus x. media* Hicksii needles	477	G. N. Chmurny, J. V. Paukstelis, A. B. Alvarado, M. T. McGuire, K. M. Snader, G. M. Muschik and B. D. Hilton
Clinoposaponins VI and VIII, two oleanane-triterpene saponins from *Clinopodium micranthum*	485	A. Yamamoto, H. Suzuki, T. Miyase, A. Ueno and T. Maeda
Squarroside A, a biologically active triterpene saponin from *Acanthophyllum squarrosum*	489	M.-A. Lacaille-Dubois, B. Hanquet, A. Rustaiyan and H. Wagner
A saponin from leaves of *Aphloia madagascariensis*	497	M.-G. Dijoux, C. Lavaud, G. Massiot, L. Le Men-Olivier and D. M. Sheeley
Quassinoids and tetranortriterpenoids from *Picrolemma granatensis*	501	E. Rodrigues Fo., J. B. Fernandes, P. C. Vieira and M. F. das G. F. da Silva
Indaquassin A and B: quassinoids from *Quassia indica*	505	K. Koike and T. Ohmoto
A tigogenin pentasaccharide from *Cestrum diurnum*	511	V. U. Ahmad, F. T. Baqai and R. Ahmad
Withanolides from *Iochroma coccineum*	517	D. Alfonso, G. Bernardinelli and I. Kapetanidis
Steroidal constituents from mature wheat straw	523	E. M. M. Gaspar and H. J. C. das Neves
Physalin and neophysalins from *Physalis alkekengi* var. *francheti* and their differentiation inducing activity	529	R. Sunayama, M. Kuroyanagi, K. Umehara and A. Ueno
Phenanthrene glucosides from *Bletilla striata*	535	M. Yamaki, T. Kato, L. Bai, K. Inoue and S. Takagi
Acylated flavonol glycosides from cabbage leaves	539	J. K. Nielsen, C. E. Olsen and M. K. Petersen
Isoflavone atropisomers from *Piscidia erythrina*	545	S. Tahara, M. Moriyama, J. L. Ingham and J. Mizutani
Three diterpenoid alkaloids from *Delphinium cossonianum*	553	G. de la Fuente, J. A. Gavin, R. D. Acosta and F. Sanchez-Ferrando
Quaternary protoberberine alkaloids from *Ceratocapnos heterocarpa*	559	R. Suau, M. V. Silva and M. Valpuesta
Alkaloids from *Melodinus hemsleyanus*	563	Li-Wei Guo and Yun-Li Zhou
Short Reports		
Eudesm-11-en-2,4α-diol from *Nardostachys chinensis*	567	K. Masuyama, H. Morita, K. Takeya and H. Itokawa
Diterpenes with a valparane skeleton from *Halimium verticillatum*	569	J. G. Urones, I. S. Marcos, C. A. Alonso, R. F. Moro and J. M. L. Rodilla

neo-Clerodane diterpenes from *Clerodendron inerme* 572 L. J. M. Rao, J. Pereira and K. N. Gurudutt

A manoyl oxide diterpenoid from *Sideritis javalambrensis* 575 A. Villar, S. Valverde, B. De Las Heras and J. M. Vivas

Diterpenoid constituents from *Rabdosia coetsa* 576 Yunlong Xu and I. Kubo

Two glabretal-type triterpenoids from the heartwood of *Aglaia ferruginaea* 579 D. A. Mulholland and T. V. Monkhe

Hydrocarbons and sterols of *Alstroemeria aurantiaca* 581 B. E. Maldoni, M. T. Lockhart and O. L. Tombesi

A meliacin from *Chisocheton paniculatus* 583 M. Bordoloi, B. Saikia, R. K. Mathur and B. N. Goswami

3-Methoxyfurocoumarins from *Pilocarpus riedelianus* 585 A. H. Müller, L. R. O. Degáspari, P. C. Vieira, M. F. das G. F. da Silva, J. B. Fernandes and J. R. Pirani

Characterization of a melanin associated with low temperature-induced browning in soybean seed coats 587 R. Takahashi and T. Akiyama

Hypostrepsilic acid, a new dibenzofuran from the cultured lichen mycobiont of *Evernia esorediosa* 589 H. Miyagawa, N. Hamada, M. Sato and T. Ueno

Number 3

Announcements ix

The Pergamon Phytochemistry Prize for 1993 593

Growth and Metabolism

Specific recognition of mugineic acid–ferric complex by barley roots 599 J. F. Ma, G. Kusano, S. Kimura and K. Nomoto

ABA induces 4-aminobutyrate accumulation in wheat seedlings 605 R. Reggiani, N. Aurisano, M. Mattana and A. Bertani

Rapid purification of polyamine oxidase from oat primary leaves 611 Zhen-Chang Li

IMP dehydrogenase from tea leaves and suspension-cultured *Catharanthus roseus* cells 613 K. Nishimura and H. Ashihara

Polygalacturonase in strawberry fruit 617 Y. Nogata, H. Ohta and A. G. J. Voragen

Chitosan-elicited laminarinase activity in *Rubus* cells or protoplasts 621 Y. Liénart, C. Gautier and A. Domard

The C-S lyases of higher plants, determination of homology by immunological procedures 625 M. F. Ho and M. Mazelis

Marked induction of basic chitinase in pumpkin in response to wounding 631 M. Esaka, A. Toyota and M. Kitabayashi

Glutamine synthetase and glutamate synthase activities in high ammonium grown wheat cells 637 W. Fricke

Metabolism of (+) abscisic acid to dihydrophaseic acid-4′-β-D-glucopyranoside by sunflower embryos 645 P. Barthe, L. R. Hogge, S. R. Abrams and M.-T. Le Page-Degivry

Inhibition of phytoalexin accumulation in potato tuber discs by superoxide scavengers 649 J. S. Ellis, P. J. Keenan, W. G. Rathmell and J. Friend

Ecological Biochemistry

S-Ethenyl cysteine; an amino acid from *Olax phyllanthi* 657 P. P. Thumfort, J. S. Pate, E. Rasins and E. L. Ghisalberti

Neurotoxic oligoisoprenoids of the hallucinogenic mushroom, *Gymnopilus spectabilis* 661 M. Tanaka, K. Hashimoto, T. Okuno and H. Shirahama

Mutangin, a dihydroagarofuranoid sesquiterpene insect antifeedant from *Elaeodendron buchananii* 665 M. K. Tsanuo, A. Hassanali, I. J. O. Jondiko and B. Torto

Potential allelopathic guaianolides from cultivar sunflower leaves, var. SH-222 669 F. A. Macías, R. M. Varela, A. Torres and J. M. G. Molinillo

Structure–activity relationships of synthetic methyl ursolate glycosides 675 M. Takechi and Y. Tanaka

Lisianthus flavonoid pigments and factors influencing their expression in flower colour 679 K. R. Markham and D. J. Ofman

Oxidative stress and plant secondary metabolism: 6″-*O*-malonylapiin in parsley 687 H. Eckey-Kaltenbach, W. Heller, J. Sonnenbichler, I. Zetl, W. Schäfer, D. Ernst and H. Sandermann, Jr

Biosynthesis

Bio-transformation of gibberellin 20,19-lactones by *Rhizopus stolonifer* 693 B. M. Fraga, J. Clemente Diaz Gomez, M. S. Ali and J. R. Hanson

Cell Culture and Biotechnology

Kinetics of alkaloid uptake by cultured cells of *Coptis japonica* 697 H. Sato, S. Tanaka and M. Tabata

Chemotaxonomy

Distribution of 2-carboxyarabinitol among plants 703 B. d. Moore, E. Isidoro and J. R. Seemann

Molecular structures of gum exudates from *Hakea* species 709 P. F. K. Eagles, A. M. Stephen and S. C. Churms

Plant Chemistry

Unusual carbohydrates from the lichen, *Parmotrema cetratum* 715 M. D. L. Corradi da Silva, P. A. J. Gorin and M. Iacomini

Anti-complementary acidic polysaccharides from roots of *Lithospermum euchromum* 719 J.-F. Zhao, H. Kiyohara, T. Matsumoto and H. Yamada

Two metabolites from the red alga *Laurencia flexilis* 725 R. de Nys, G. M. König, A. D. Wright and O. Sticher

Phenylethanoid glycosides of *Sesamum indicum* 729 N. Suzuki, T. Miyase and A. Ueno

Norisoprenoids from *Centaurea aspera* and *C. salmantica* 733 I. Fernández, J. R. Pedro and R. Vidal

Sesquiterpenes from *Brintonia discoidea* 737 T. Lu, D. Vargas and N. H. Fischer

Two farnesol derivatives from *Tanacetum densum* subsp. *sivasicum* 743 N. Gören

Diterpenes with a valparane skeleton 747 J. G. Urones, I. S. Marcos, P. Basabe, C. Alonso, I. M. Oliva, N. M. Garrido, D. D. Martín and A. M. Lithgow

Diterpenoid constituents of the liverwort *Nardia subclavata* 751 M. Toyota and Y. Asakawa

Isolation and structure determination of three triterpenes from bark resin of juvenile European white birch 755 H. T. Taipale, J. Vepsäläinen, R. Laatikainen, P. B. Reichardt and S. P. Lapinjoki

Revised structure of 20-hydroxytingenone and ^{13}C NMR assignments of 22β-hydroxytingenone 759 K. Likhitwitayawuid, R. Bavovada, Long-Ze Lin and G. A. Cordell

Squalene derivatives from *Eurycoma longifolia* 765 H. Morita, E. Kishi, K. Takeya, H. Itokawa and Y. Iitaka

Triterpenoid oligoglycosides from *Chionodoxa luciliae*	773	M. Adinolfi, M. M. Corsaro, R. Lanzetta, A. Mancino, L. Mangoni and M. Parrilli
Hexacarbocyclic triterpenes from leaves of *Cryptomeria japonica*	779	Wen-Chiung Su, Jim-Min Fang and Yu-Shia Cheng
Disformone and dischidiol from *Dischidia formosana*	783	Zong-Shiow Chen, Gene-Hsiang Lee and Yueh-Hsiung Kuo
Illustrol, a seco-norpregnane derivative from *Mandevilla illustris*	787	R. A. Yunes, R. L. Brum, J. B. Calixto and H. Rimpler
Lanosterol and 27-norlanosterol oligosaccharides from the bulbs of *Chionodoxa gigantea*	791	Y. Mimaki, S. Kubo, Y. Kinoshita, Y. Sashida, L.-G. Song, T. Nikaido and T. Ohmoto
Steroidal glycosides from *Allium albopilosum* and *A. ostrowskianum*	799	Y. Mimaki, K. Kawashima, T. Kanmoto and Y. Sashida
16-Oxygenated withanolides from the leaves of *Discopodium penninervium*	807	S. Habtemariam, A. I. Gray and P. G. Waterman
Two chromenes and a prenylated benzoic acid derivative from *Piper aduncum*	813	J. Orjala, C. A. J. Erdelmeier, A. D. Wright, T. Rali and O. Sticher
Coumarins and coumarin glucosides from the fruits of *Ammi majus*	819	M. H. A. Elgamal, N. M. M. Shalaby, H. Duddeck and M. Hiegemann
3-Hydroxycoumarin glycosides from *Alyxia reinwardti* var. *lucida*	825	Lee-Juian Lin, Long-Ze Lin, N. Ruangrungsi and G. A. Cordell
Bisbibenzyls and lignans from *Pellia epiphylla*	831	F. Cullmann, K.-P. Adam and H. Becker
Neolignans and *nor*-neolignans from *Krameria paucifolia*	835	H. Achenbach, W. Utz and X. A. Dominguez
Cytotoxic flavonolignans and flavones from *Verbascum sinaiticum* leaves	839	M. S. A. Afifi, M. M. Ahmed, J. M. Pezzuto and A. D. Kinghorn
Nuclear magnetic resonance studies of 5,7-dihydroxyflavonoids	843	Chien-Chang Shen, Yuan-Shiun Chang and Li-Kang Ho
Flavonoids and a saponin from *Spartium junceum*	847	A. R. Bilia, F. Flammini, G. Flamini, I. Morelli and A. Marsili
Three flavonoids from the stem bark of the antimalarial *Uvaria dependens*	853	M. H. H. Nkunya, R. Waibel and H. Achenbach
Short Reports		
Dehydroodorin, a cytotoxic diamide from the leaves of *Aglaia formosana*	857	Chang-Yih Duh, Shang-Kwei Wang, Rei-Sheu Hou, Yang-Chang Wu, Yu Wang, Ming-Chu Cheng and Tai-Tsung Chang
Absolute configuration of eremophilenolides from *Hertia cheirifolia*	859	P. Aclinou and G. Massiot
An oleanolic acid based bisglycoside from *Clematis montana* roots	861	R. P. Thapliyal and R. P. Bahuguna
Abietane diterpenes from *Salvia munzii*	863	J. G. Luis and T. A. Grillo

Hydroxymanoyloxides from *Kyllinga erecta* 865 Y. Mahmout, J.-M. Bessiere and R. Dolmazon

Withanolides of *Datura fastuosa* leaves 868 M. Manickam, A. Sinha-Bagchi, S. C. Sinha, M. Gupta and A. B. Ray

A pregnane structurally related to withanolides from *Physalis viscosa* 871 G. L. Silva, A. Pacciaroni, J. C. Oberti, A. S. Veleiro and G. Burton

3-*epi*-Austrobailignan-7: a 2,5-diaryl-3,4-dimethyltetrahydrofuranoid lignan from *Aristolochia chilensis* 874 A. Urzua and L. Presle

Monoterpene alkaloids from *Tecoma stans* 876 A. P. Lins and J. D'arc Felicio

Two sesquiterpene pyridine alkaloids from *Euonymus sachalinensis* 879 J. Hohmann, G. Nagy, G. Günther and L. Varjas

A quinoline alkaloid from *Aristotelia chilensis* 881 C. Cespedes, J. Jakupovic, M. Silva and F. Tsichritzis

Number 4

Announcement ix

Obituary
Robert Horowitz 1921–1993 xi S. Horowitz

Review Article Number 84
Current trends in microbial steroid biotransformation 883 S. B. Mahato and I. Majumdar

Growth and Metabolism
Adenylyl cyclase activity in roots of *Pisum sativum* 899 B. Pacini, A. Petrigliano, P. Diffley, A. Paffetti, E. G. Brown, P. Martelli, L. Trabalzini, L. Bovalini, P. Lusini and R. P. Newton

Oxidation of the 8′-position of a biologically active abscisic acid analogue 905 N. Lamb, A. C. Shaw, S. R. Abrams, M. J. T. Reaney, B. Ewan, A. J. Robertson and L. V. Gusta

Effect of chemical modification on some structural and functional properties of pennisetin, a major seed storage protein from pearl millet 919 M. N. Sainani, V. S. Gupta, V. K. Mishra, A. H. Lachke, P. K. Ranjekar and D. T. N. Pillay

Purification and some properties of polyphenoloxidase from sunflower seeds 927 J. Raymond, N. Rakariyatham and J. L. Azanza

Cationic peanut peroxidase and the oxidation of ferulic acid 933 R. B. van Huystee and X. Zheng

Subcellular and surface localization of the membrane-bound apyrase (ATP diphosphohydrolase EC 3.6.1.5) from wheat seedlings 941 M. A. Komoszyński

Expression of (*S*)-scoulerine 9-*O*-methyltransferase in *Coptis japonica* plants 949 H. Fujiwara, N. Takeshita, Y. Terano, J. H. Fitchen, T. Tsujita, Y. Katagiri, F. Sato and Y. Yamada

A postharvest heat treatment inhibits cell wall degradation in apples during storage 955 N. B. Shalom, J. Hanzon, J. D. Klein and S. Lurie

Effect of metabolic intermediates on the accumulation of polyamines in detached soybean leaves 959 F. J. Turano and G. F. Kramer

Lipids and lipid metabolism in the marine alga *Enteromorpha intestinalis* 969 A. L. Jones and J. L. Harwood

Herbicide-resistant lines of microalgae: growth and fatty acid composition	973	Z. Cohen, M. Reungjitchachawali, W. Siangdung, M. Tanticharoen and Y. M. Heimer
Formation of 6,7,4′-trihydroxyisoflavone (factor 2) from soybean seed isoflavones by bacteria isolated from tempe	979	K. Klus, G. Börger-Papendorf and W. Barz
Ecological Biochemistry		
Effect of hydroxamic acids from cereals on aphid cholinesterases	983	L. Cuevas and H. M. Niemeyer
Emission of ethanol and monoterpenes by fungal infected lodgepole pine trees	987	R. I. Gara, W. R. Littke and D. F. Rhoades
Acetone emission from conifer buds	991	R. C. MacDonald and R. Fall
Ascosalitoxin, a phytotoxic trisubstituted salicylic aldehyde from *Ascochyta pisi*	995	A. Evidente, R. Capasso, M. Vurro and A. Bottalico
Pinolidoxin, a phytotoxic nonenolide from *Ascochyta pinodes*	999	A. Evidente, R. Lanzetta, R. Capasso, M. Vurro and A. Bottalico
Altersolanol-related antimicrobial compounds from a strain of *Alternaria solani*	1005	N. Okamura, H. Haraguchi, K. Hashimoto and A. Yagi
Release of gramine from the surface of barley leaves	1011	H. Yoshida, H. Tsumuki, K. Kanehisa and L. J. Corcuera
Biosynthesis		
Lipid composition and biosynthesis in protoplasts from cucumber cotyledons	1015	M. K. Pomeroy and J. B. Mudd
Bicarbonate stimulates stearate synthesis in chloroplasts: discrimination against stearate in the biosynthesis of glycerolipids	1021	J. Sanchez and J. B. Mudd
Biosynthesis of 13*R*-hydroxyarachidonic acid, an unusual oxylipin from the red alga *Lithothamnion corallioides*	1029	W. H. Gerwick, P. Åsen and M. Hamberg
The microbiological transformation of 14β,19-dihydroxy-ent-kaur-15-ene by *Gibberella fujikuroi*	1035	B. M. Fraga, F. García-Tellado, P. González and M. G. Hernández
Biogenetic implication of lupin alkaloid biosynthesis in bitter and sweet forms of *Lupinus luteus* and *L. albus*	1041	K. Saito, Y. Koike, H. Suzuki and I. Murakoshi
Cell Culture and Biotechnology		
Biotransformation of (−)-borneol by cultured cells of *Eucalyptus perriniana*	1045	Y. Orihara and T. Furuya
Biotransformation of 18β-glycyrrhetinic acid by ginseng hairy root culture	1049	Y. Asada, H. Saito, T. Yoshikawa, K. Sakamoto and T. Furuya
Chemotaxonomy		
Taxonomical assignment of chlorococal algae from their cell wall composition	1053	H. Takeda
Unusual hydroxy fatty acids from some higher fungi	1057	V. M. Dembitsky, T. Řezanka and E. E. Shubina
Plant Chemistry		
Oplopanone derivatives and monoterpene glycosides from *Artemisia sieberi*	1061	J. A. Marco, J. F. Sanz-Cervera, F. Sancenon, J. Jakupovic, A. Rustaiyan and F. Mohamadi
Structure of sesquiterpene glucosides from potato leaves	1067	H. Tazaki, N. Ohta, K. Nabeta, H. Okuyama and M. Okumura
Sesquiterpenes of *Tanacetum chiliophyllum* var. *heimerlei*	1071	N. Gören and E. Tahtasakal
Prevernocistifolides from *Vernonia galamensis*	1075	R. E. Perdue Jr, F. Tsichritzis and J. Jakupovic

Ratibinolide III, a sesquiterpene lactone glucoside from *Ratibida latipalearis*	1079	A. Jimenez, R. Pereda-Miranda, R. Bye, E. Linares and R. Mata
Eudesmane sesquiterpenes from *Teucrium heterophyllum*. The X-ray structure of teucdiol A	1083	B. M. Fraga, M. G. Hernández, T. Mestres, J. M. Arteaga and A. Perales
Clerodane diterpenoids from *Baccharis articulata*	1087	J. Dai, R. Suttisri, E. Bordas, D. D. Soejarto and A. D. Kinghorn
Neo-clerodane diterpenoids from *Ajuga macrosperma* and *Ajuga pantantha*	1091	Xiaoyu Shen, Akira Isogai, K. Furihata, Handong Sun and A. Suzuki
Teulamioside, a *neo*-clerodane glucoside from *Teucrium lamiifolium*	1095	P. Y. Malakov, G. Y. Papanov, I. M. Boneva, M. C. de la Torre and B. Rodríguez
Diterpenoids from *Isodon wikstroemioides*	1099	Wu Shun-Hua, Zhang Hong-Jie, Chen Yi-Ping, Lin Zhong-Wen and Sun Han-Dong
Endoperoxide diterpenes from *Calceolaria purpurea*	1103	M. C. Chamy, M. Piovano, J. A. Garbarino, C. Pascard and M. Cesario
Norditerpene dilactones from *Podocarpus nagi*	1107	Bai-Ping Ying and Isao Kubo
Triterpenoids from *Anamirta cocculus*	1111	L. Jayasinghe, G. P. Wannigama and J. K. Macleod
Saponins from leaves of *Acanthopanax sieboldianus*	1117	H. Sawada, M. Miyakoshi, S. Isoda, Y. Ida and J. Shoji
A dammarane-type saponin from the roots of *Ampelozizyphus amazonicus*	1123	M. G. L. Brandao, M.-A. Lacaille-Dubois, M. A. Teixeira and H. Wagner
Proanthocyanidins from *Cistus incanus*	1129	A. Danne, F. Petereit and A. Nahrstedt
Bisbibenzyl and sesquiterpenoids from the liverwort *Jubula japonica*	1135	M. Toyota and Y. Asakawa
Substituted bibenzyls, phenanthrenes and 9,10-dihydrophenanthrenes from the heartwood of *Combretum apiculatum*	1139	E. Malan and E. Swinny
Flavone di-*C*-glycosides from *Plagiochila jamesonii* and *Plagiochasma rupestre*	1143	R. Schoeneborn and R. Mues
Alkaloids of *Erythroxylum zambesiacum* stem-bark	1147	P. Christen, M. F. Roberts, J. D. Phillipson and W. C. Evans
Steroidal alkaloids from roots of tomato stock	1153	T. Nagaoka, T. Yoshihara, J. Ohra and S. Sakamura
Structural characterization of piperidine alkaloids from *Pandanus amaryllifolius* by inverse-detected 2D NMR techniques	1159	M. G. Nonato, M. J. Garson, R. J. W. Truscott and J. A. Carver
Diterpene alkaloids from *Delphinium fissum* subsp. *anatolicum*	1165	A. Ulubelen, A. H. Mericli, F. Mericli, R. Ilarslan and W. Voelter
Short Reports		
A secoiridoid glycoside from *Osmanthus asiaticus*	1169	M. Sugiyama, K. Machida, N. Matsuda and M. Kikuchi
A *seco*-bis-norguaianolide from *Achillea pseudoaleppica*	1171	G. Appendino, J. Jakupovic, H. Ç. Özen and N. Schuster
A clerodane diterpene from *Ajuga salicifolia*	1173	P. I. Bozov, G. Y. Papanov, P. Y. Malakov, M. C. de la Torre and B. Rodríguez

Terpenoids from *Isodon grandifolia* var. *atuntzensis*	1176	Wu Shun-Hua, Zhang Hong-Jie, Lin Zhong-Wen and Sun Han-Dong
An unusual [2 + 2] cycloadduct of terpenoid coumarin from *Ethulia vernonioides*	1179	N. Schuster, C. Christiansen, J. Jakupovic and M. Mungai
A bioactive dihydrodibenzoxepin from *Juncus effusus*	1182	M. Della Greca, A. Fiorentino, A. Molinaro, P. Monaco and L. Previtera
Lignans in flower buds of *Magnolia saulangiana*	1185	O. M. Abdallah
Phenylpropanoid glycosides from *Pedicularis striata pall* ssp. *arachnoidea*	1188	Jia Zhong-Jian and Gao Jian-Jun
C-Glycosylflavones from *Ceratonia siliqua* cotyledons	1191	M. T. Batista and E. T. Gomes
Flavanoid from resin glands of *Azadirachta indica*	1194	C. Balasubramanian, P. S. Mohan, K. Arumugasamy and K. Udaiyan
Kaempferol 3-*O*-[6″-*O*-(3-hydroxy-3-methylglutaroyl) glucoside] from leaves of *Polygala japonica*	1196	Keun Young Jung, Jae Chul Do and Kun Ho Son
7-Angelyl-1-methylenepyrrolizidines from *Senecio chrysocoma*	1198	J. R. Liddell and C. G. Logie

Number 5

Announcement	ix	
Review Article Number 85		
The biogeneration of green odour by green leaves	1201	A. Hatanaka
Growth and Metabolism		
Synthesis, stability and biological activity of 19-desoxy-gibberellins A_1 and A_3	1219	J. L. Ward, G. J. Reynolds, R. Hooley and M. H. Beale
Assay of chalcone synthase activity by high-performance liquid chromatography	1225	K. W. M. Zuurbier, Suen-Ying Fung, J. J. C. Scheffer and R. Verpoorte
Inhibition of plant ornithine aminotransferase by gabaculine and 4-amino-5-hexynoic acid	1231	F. Hervieu, F. Le Dily, J. Le Saos, J.-P. Billard and C. Huault
Changes in grapefruit flavedo cell wall noncellulosic neutral sugar composition	1235	E. J. Mitcham and R. E. McDonald
Structure–activity relationships of synthetic tigogenyl glycosides	1241	M. Takechi and Y. Tanaka
Xylogenesis and phenylpropanoid metabolism in cultured *Zinnia* mesophyll cells	1245	A. S. Sudibyo and J. W. Anderson
Variation in concentrations of phloridzin and phloretin in apple foliage	1251	M. D. Hunter and L. A. Hull
Characterization and trypsin inhibitor activity of proanthocyanidins from *Vicia faba*	1255	J. P. F. G. Helsper, H. Kolodziej, J. M. Hoogendijk and A. van Norel
Ecological Biochemistry		
Amino acid sequence of the α-elicitin secreted by *Phytophthora cactorum*	1261	J.-C. Huet, M. Mansion and J.-C. Pernollet
Monocerin in *Exserohilum turcicum* isolates from maize and a study of its phytotoxicity	1265	F. Cuq, S. Herrmann-Gorline, A. Klaebe, M. Rossignol and M. Petitprez
Inoculation of *Platanus acerifolia* with *Ceratocystis fimbriata* f. sp. *platani* induces scopoletin and umbelliferone accumulation	1271	C. El Modafar, A. Clerivet, A. Fleuriet and J. J. Macheix

Boll weevil antifeedants from *Arundo donax* 1277 D. H. Miles, K. Tunsuwan, V. Chittawong, U. Kokpol, M. I. Choudhary and J. Clardy

Calystegines in *Solanum* and *Datura* species and the death's-head hawk-moth (*Acherontia atropus*) 1281 R. J. Nash, M. Rothschild, E. A. Porter, A. A. Watson, R. D. Waigh and P. G. Waterman

Biosynthesis

Effects of oligogalacturonides on biosynthesis of shikonin in *Lithospermum* cell cultures 1285 M. Tani, K. Takeda, K. Yazaki and M. Tabata

Biosynthesis of secoiridoid glucosides in Oleaceae 1291 S. Damtoft, H. Franzyk and S. R. Jensen

Biotransformation of arteannuic acid into arteannuin-B and artemisinin in *Artemisia annua* 1301 R. S. Sangwan, K. Agarwal, R. Luthra, R. S. Thakur and N. Singh-Sangwan

Glycyrrhetinic acid 24-hydroxylase activity in microsomes of cultured licorice cells 1303 H. Hayashi, S. Hanaoka, S. Tanaka, H. Fukui and M. Tabata

Cell Culture and Biotechnology

Forskolin production in untransformed root culture of *Coleus forskohlii* 1309 J. Sen, A. K. Sharma, N. P. Sahu and S. B. Mahato

Rapid production of irones by maturation of orris rhizomes with two bacterial strains 1313 B. Belcour, D. Courtois, C. Ehret and V. Petiard

Cardenolides in the regenerated plants obtained from *Strophanthus divaricatus* calli 1317 K. Kawaguchi, I. Asaka, M. Hirotani, T. Furuya and S. Katsuki

Chemotaxonomy

Betaine lipids and phospholipids in brown algae 1323 W. Eichenberger, S. Araki and D. G. Müller

Occurrence of C_{40}–C_{130} polyisoprenoid alcohols in lower plants 1335 T. Řezanka and V. M. Dembitsky

Sesquiterpenoids from some European liverworts 1341 F. Nagashima, Y. Sari, M. Tori, Y. Asakawa and S. Huneck

Sterols and phylogeny of the acidophilic hot springs algae *Cyanidium caldarium* and *Galdieria sulphuraria* 1345 J. Seckbach, R. Ikan, D. Ringelberg and D. White

Genetic and chemical polymorphisms of saponins in soybean seed 1351 C. Tsukamoto, A. Kikuchi, K. Harada, K. Kitamura and K. Okubo

Plant Chemistry

Anti-inflammatory and immunologically active polysaccharides of *Sedum telephium* 1357 A. Sendl, N. Mulinacci, F. F. Vincieri and H. Wagner

Fatty acids in seed oil from *Turnera ulmifolia* 1363 K. M. Hosamani

Iridoid and other glycosides from *Penstemon* species 1367 M. S. Abdel-Kader and F. R. Stermitz

A secoiridoid glucoside and a phenolic compound from *Fraxinus ornus* bark 1373 T. Iossifova, B. Mikhova and I. Kostova

neo-Clerodane type diterpenes from *Baccharis trinervis* 1377 M. Kuroyanagi, K. Uchida, A. Ueno, M. Satake and K. Shimomura

A triterpene from *Marsdenia globifera* 1385 Qiu Sheng-Xiang, Gong Yong and H. T. A. Cheung

Triterpenoid glycosides from *Stauntonia hexaphylla* 1389 Huai-Bin Wang, R. Mayer and G. Rücker

Triterpenoid saponins from *Anemone hupehensis* 1395 Ming-Kui Wang, Feng-E Wu and Yiao-Zu Chen

Cardenolide glycosides with doubly linked sugars from *Gomphocarpus sinaicus* 1399 H. El-Askary, J. Hölzl, S. Hilal and E. El-Kashoury

Oligostilbenoids from *Gnetum venosum* 1403 N. Boralle, H. E. Gottlieb, O. R. Gottlieb, K. Kubitzki, L. M. X. Lopes, M. Yoshida and M. C. M. Young

Lignans and naphthoquinones from *Tabebuia incana* 1409 A. Braga de Oliveira, D. S. Raslan, G. G. de Oliveira and J. G. S. Maia

Xanthones and vismiones from *Psorospermum febrifugum* 1413 M. Abou-Shoer, K. Suwanborirux, A.-A. M. Habib, Ching-Jer Chang and J. M. Cassady

Pyrrolizidine alkaloids from *Crotalaria aegyptiaca* 1421 E. Roeder, T. Sarg, S. El-Dahmy and A. A. Ghani

NMR assignments of huperzine A, serratinine and lucidioline 1425 Bing-Nan Zhou, Da-Yuan Zhu, Mei-Fen Huang, Lee-Juian Lin, Long-Ze Lin, Xue-Yi-Han and G. A. Cordell

Short Reports

Isethionic acid from the marine red alga *Ceramium flaccidum* 1429 K. D. Barrow, U. Karsten and R. J. King

Aroma glycosides from *Hovenia dulsis* 1431 K. Yoshikawa, M. Nagai, M. Wakabayashi and S. Arihara

A sesquiterpene glucoside from *Reichardia tingitana* 1434 M. Abdel-Mogib, S. N. Ayyad, M. M. Abou-Elzahab and A. M. Dawidar

Sesquiterpene lactones of *Arnica cordifolia*, subgenus *Austromontana* 1436 I. Merfort and D. Wendisch

Coleons from *Nepeta elliptica* 1438 R. Bhandari, C. S. Mathela, P. S. Beauchamp, A. T. Bottini and V. Dev

Knipholone anthrone from *Kniphofia foliosa* 1440 E. Dagne and A. Yenesew

(*R*)-Prechrysophanol from *Aloe graminicola* 1442 A. Yenesew, J. A. Ogur and H. Duddeck

Antimicrobial chlorinated orcinol derivatives from mycelia of *Hericium erinaceum* 1445 K. Okamoto, A. Shimada, R. Shirai, H. Sakamoto, S. Yoshida, F. Ojima, Y. Ishiguro, T. Sakai and H. Kawagishi

Narcisine, an alkaloid from *Narcissus tazetta* 1447 O. M. Abdallah

Toddaquinoline from Formosan *Toddalia asiatica* 1449 Ih-Sheng Chen, Ian-Lih Tsai, Shwu-Jen Wu, Wine-Show Sheen, T. Ishikawa and H. Ishii

Number 6

Review Article Number 86

Insect pest control by copying nature using genetically engineered crops 1453 D. Boulter

Growth and Metabolism

Oxidation of ^{35}S-labelled elemental sulphur by wheat chloroplasts and analysis of ^{35}S-products 1467 P. Jolivet, E. Bergeron and J.-C. Meunier

Action of *Carica papaya* latex on cell wall glycosidases from *Lactuca sativa* pith 1473 R. Giordani and L. Lafon

Cloned *Agrobacterium tumefaciens ipt*1 gene product, DMAPP: AMP isopentenyl transferase 1477 J. R. Blackwell and R. Horgan

Occurrence and origin of *ent*-17-hydroxykaur-15-ene and *ent*-17-hydroxykaur-15-en-19-oic acid in shoots of *Zea mays* 1483 J. MacMillan and P. Gaskin

Ecological Biochemistry

Airborne volatiles from the foliage of three cultivars of autumn flowering chrysanthemums 1489 J. R. Storer, J. S. Elmore and H. F. Van Emden

Structure–antimicrobial activity relationships of abietane diterpenes from *Salvia* species 1493 L. Moujir, A. M. Gutiérrez-Navarro, L. San Andrés and J. G. Luis

Biosynthesis

Biotransformation of 6-gingerol and 6-shogaol by *Aspergillus niger* 1497 H. Takahashi, T. Hashimoto, Y. Noma and Y. Asakawa

Biotransformation of lignans: a specific microbial oxidation of (+)-eudesmin and (+)-magnolin by *Aspergillus niger* 1501 M. Miyazawa, H. Kasahara and H. Kameoka

Cell Culture and Biotechnology

Levels of metabolites related to glycolysis in *Catharanthus roseus* cells during culture 1509 K. Kubota and H. Ashihara

Production of rotenoids by heterotrophic and photomixotrophic cell cultures of *Tephrosia vogelii* 1515 N. Lambert, M.-F. Trouslot, C. Nef-Campa and H. Chrestin

Chemotaxonomy

Fatty acids from 28 marine microalgae 1521 A.-C. Viso and J.-C. Marty

Diacylglyceryltrimethylhomoserines and phospholipids of some lichen species 1535 V. M. Dembitsky, I. A. Bychek and O. A. Rozentsvet

An isoflavanoid from *Aglaia ferruginaea*, an Australian member of the Meliaceae 1537 F. M. Dean, T. V. Monkhe, D. A. Mulholland and D. A. H. Taylor

Plant Chemistry

L-Galactose containing galactans from the carrageenophyte *Gigartina skottsbergii* 1541 M. Ciancia, M. C. Matulewicz and A. S. Cerezo

Monoterpene glucosides and other constituents from *Perilla frutescens* 1545 T. Fujita and M. Nakayama

Oxygenated germacranes from *Santolina chamaecyparissus* 1549 J. A. Marco, J. F. Sanz-Cervera, M. Carda and J. Lex

Sesquiterpene lactones from Iranian *Artemisia* species 1561 J. A. Marco, J. F. Sanz-Cervera, E. Manglano, F. Sancenon, A. Rustaiyan and M. Kardar

Guaianolides and an ethylcyclohexane lactone from *Andriala integrifolia* 1565 G. M. Massanet, F. Rodriguez-Luis, C. V. Chozas, F. M. Guerra and J. M. Dorado

Xanthanolides from *Xanthium*: absolute configuration of xanthanol, isoxanthanol and their C-4 epimers 1569 J. A. Marco, J. F. Sanz-Cervera, J. Corral, M. Carda and J. Jakupovic

Minor diterpenes from *Coleus forskohlii* 1577 R. Roy, A. Mishra, N. Varma, J. S. Tandon, M. Saux and A. Carpy

Diterpenes from the bark of *Juniperus chinensis* 1581 Jim-Min Fang, Yi-Chien Sou, Yu-Hung Chiu and Yu-Shia Cheng

Linear diterpene with antimitotic activity from the brown alga *Bifurcaria bifurcata* 1585 R. Valls, B. Banaigs, L. Piovetti, A. Archavlis and J. Artaud

Neo-clerodane diterpenoids from *Scutellaria alpina* subsp. *javalambrensis*	1589	M. C. DE LA TORRE, B. RODRÍGUEZ, M. BRUNO, P. Y. MALAKOV, G. Y. PAPANOV, F. PIOZZI and G. SAVONA
An abietane diterpenoid glycoside from *Rabdosia eriocalyx*	1595	XIAOYU SHEN, A. ISOGAI, K. FURIHATA, HANDONG SUN and A. SUZUKI
3α-Hydroxy-oleanane-type triterpene glycosyl esters from leaves of *Acanthopanax spinosus*	1599	M. MIYAKOSHI, Y. IDA, S. ISODA and J. SHOJI
Sapelenins A, B and C, acyclic triterpenoids from the stem bark of *Entandrophragma cyclindricum*	1603	D. NGNOKAM, G. MASSIOT, J.-M. NUZILLARD, J. D. CONNOLLY, E. TSAMO and C. MORIN
A triterpene saponin from *Herniaria glabra*	1609	H. SCHRÖDER, M. SCHUBERT-ZSILAVECZ, G. REZNICEK, J. CART, J. JURENITSCH and E. HASLINGER
Polyoxypregnanes from *Marsdenia tenacissima*	1615	SI-QI LUO, LONG-ZE LIN, G. A. CORDELL, LIANG XUE and M. E. JOHNSON
Bisepoxylignan glycosides from *Stauntonia hexaphylla*	1621	HUAI-BIN WANG, R. MAYER, G. RÜCKER and M. NEUGEBAUER
Phenolics from *Tectaria subtriphylla*	1625	FENG-LIN HSU and JHY-YIH CHEN
A re-investigation of the alkaloids of *Senecio pterophorus*	1629	J. R. LIDDELL and C. G. LOGIE
Short Reports		
N-Fatty acyl tryptamines from *Annona reticulata*	1633	U. MAEDA, N. HARA. Y. FUJIMOTO, A. SRIVASTAVA, Y. K. GUPTA and M. SAHAI
Tomentoside and 7-hydroxytomentoside, two iridoid glucosides from *Paulownia tomentosa*	1636	S. DAMTOFT and S. R. JENSEN
Sesquiterpenes of *Cladanthus arabicus*	1639	W. M. DANIEWSKI, W. DANIKIEWICZ, M. GUMUŁKA, E. PANKOWSKA, J. KRAJEWSKI, H. GRABARCZYK and M. WICHŁACZ
Aromadendrane sesquiterpene from *Mandevilla pentlandiana*	1642	G. M. CABRERA, J. C. OBERTI, E. G. GROS and A. M. SELDES
Sesquiterpene lactones from *Lactuca saligna*	1644	W. KISIEL and D. GROMEK
Secoeudesmanolides from *Inula japonica*	1647	F. JESKE, S. HUNECK and J. JAKUPOVIC
Vismiones L and M from *Ochna pulchra*	1650	S. SIBANDA, C. NYANYIRA, M. NICOLETTI and C. GALEFFI
Flavanones of *Lophopappus tarapacanus* and triterpenoids of *Pachylaena atriplicifolia*	1653	M. HOENEISEN, M. SILVA, J. JAKUPOVIC, F. PAPASTERGIOU and M. G. PETER
Isoflavonoids in roots of *Sophora fraseri*	1654	M. IINUMA, M. OHYAMA, T. TANAKA, M. P. HEGARTY and E. E. HEGARTY
Alkaloids from *Narcissus leonensis*	1656	J. BASTIDA, F. VILADOMAT, S. BERGOÑON, J. M. FERNANDEZ, C. CODINA, M. RUBIRALTA and J.-C. QUIRION
Alkaloids from *Zanthoxylum simulans*	1659	SHWU-JEN WU and IH-SHENG CHEN
Errata	1663	